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REGIONAL MUNICIPALITY OF HALTON

# Executive Summary of the Report on Inflow & Infiltration In South West Oakville

January 1982

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## Introduction

Our report of May 1980 entitled "Report on Basement Flooding in South West Oakville" for the Region of Halton was written from investigations and monitoring of the sewer system in order to determine methods in which the sanitary sewer system could be relieved of excess sewage flows in an area of South West Oakville where residents experienced flooding problems.

The study for our previous report revealed that inflow and infiltration was not a problem in the Woodhaven Park drainage area south of Rebecca Street. However, it was observed north of Rebecca Street and west of Warminster Drive that the sewers in certain areas were not in good condition. It can be noted that any inflow and infiltration from this area can add to the problem of flooding south of Rebecca Drive. Although flooding of the said area has not occurred since remedial measures were made in September of 1980, it must be borne in mind that rainfalls since that period have not exceeded those which caused the flooding in December of 1979.

Our work in 1980 showed that surcharging of the system occurred in times of heavy rainfall due to the inability of the sewers to transport the flows coming from the area north of Rebecca Street.

As part of the measures to alleviate the problem in the area where residents were experiencing flooding we recommended that the hydraulic performance of the sewer system be improved.

## Purpose of Report of January 1982

In Phase I of the present report of January 1982 entitled "Report on Inflow and Infiltration in South West Oakville" we investigated the performance of the modified section of the sewer system in the area which was subject to problems of flooding. In Phase II of this report we investigated the sub-systems and drainage area tributaries north of Rebecca Street and west of Warminster Drive in greater detail than had been done before in the report of 1980. The purpose of this exercise was to determine whether or not there was one area which had the greatest ingression of inflow and infiltration.

Plan 'A' indicates an area of Town of Oakville and shows the approximate extent of the Total area under investigation in this study.

Plan 'B' shows the drainage areas under investigation in this study of 1981.

## Observations

(i) Since the remedial works were completed in September of 1980 the system has performed adequately, but has not yet been subjected to rainfall conditions similar to those that were a cause of flooding in December 1979.

The nearest station to record rainfall measurements in the Oakville area is at the South East Oakville Water Pollution Control Plant. According to records for this station the total rainfall experienced on December 25 1979 was 41 mm. Since remedial work was done in September 1980 the greatest rainfall recorded was 32.8 mm in July 1981 and this did not cause any concern to the residents who previously experienced flooded basements.

(ii) We were able to conclude from our detailed investigation of the sewer sub-systems north of Rebecca Street and west of Warminster Drive that inflow and infiltration is in excess of present design standards and is greater than the allowance made for infiltration in the design of the trunk sewer system.

The two areas which have the greatest inflow and infiltration problems were observed to be:

a) Area IB - East of Vickery Drive drained by the sewer in Tennyson Drive

and

b) Area IIA - North of Hopedale Shopping Centre which is north of Rebecca Street and West of Warminster Drive.

Plan C, enclosed with this executive summary, indicates the sewers which have problems with regard to inflow and infiltration.

(iii) From a review of the television work collated by the Region we were able to indicate on this plan the extent of damage to the sewers that were under investigation.

There appear to be three categories of damage in which the sewers may be listed and each of these categories is defined as below:

Category A: All sewers in this category appear to be in good condition and show no evidence of infiltration.

Category B: Most of the sewers that may be listed in this category have hairline cracks and uneven joints. These faults allow infiltration.

Category C: Several sewers were found to be out of round, severely cracked in many places and have broken joints, hairline cracks and broken crowns with some root growths. Generally these sewers were found to be incapable of transporting flows in the manner for which they were designed.

(iv) The sewers which transport all the flows from areas north of Rebecca Street and west of the South West Water Pollution Control Plant as shown on Plan "A" enter the plant along Lakeshore Road. We observed that under conditions of high flows, sections of the sewer along Lakeshore Road were subject to surcharging. We believe that this is partly because of the configuration of the sewers at the inlet chamber at the pumping station.

(v) During our investigations, we noted, on several occassions, that the flap gate valve in the overflow chamber at the pumping station was malfunctioning and consequently plant effluent, or lakewater, or both was re-entering the plant for treatment. This results in a reduction in efficiency of the plant and increases the cost of treatment.

Recommendations

We recommend that the excess inflow and infiltration be removed from the sewers in the sub-basins of Vickery Drive and north of Rebecca Street, west of Warminster Drive. This may be achieved by a program of sewer replacement and relining in these areas.

We recommend that the inlet chamber at the pumping station be reconstructed. This will result in the improved hydraulic performance of the sewer sections at the pumping station.

In order to reduce the large percentage of water, from the lake or from plant effluent, re-entering the treatment plant we recommend that a motorized valve gate be installed to replace the existing flap gate.

We also feel that further improvement to the benching in the manholes at:

a) the junction of Vickery Drive and Sabel Street and,

b) the manhole at the southern most junction of Selgrove Crescent with Woodhaven Park Drive

would result in further improved hydraulic performance at these points.

Our estimate for costs for the solutions to these three problems are as follows:

1982 Remedial Works and Costs

i) Carry out manhole and sewer modifications at the main sewage pumping station and cost of the intersection of Woodhaven Park Drive and Lakeshore Road. This work would be carried out to relieve the

surcharging effect which has occurred in the sanitary sewers on Lakeshore Road near the main sewage pumping station. The estimated cost for this work is as follows:

| | |
|---|---|
| Construction | $120,000 |
| Engineering | 24,000 |
| Total | $144,000 |

ii) Modifications to the overflow chamber at the main sewage pumping station. These modifications would involve the installation of an automatic sluice gate to permit bypassing during high flow conditions and to prevent lakewater entering the sanitary sewer system. The estimated cost for this work is as follows:

| | |
|---|---|
| Construction | $ 55,000 |
| Engineering | 5,500 |
| Total | $ 60,500 |

iii) Modifications to the benching in the manholes identified in Woodhaven Park Drive and Vickery Drive. The estimated cost for this work is as follows:

| | |
|---|---|
| Construction | $ 2,000 |
| Engineering | n/a |
| Total | $ 2,000 |

iv) In addition to all of the above noted items, we estimate that in 1982 the cost of a programme of sewer replacement to be carried out in the problem areas identified on Plan 'C' in the Appendix would be as follows:

| | |
|---|---|
| Construction | $ 60,000 |
| Engineering | 6,000 |
| Total | $ 66,000 |

Before we summarize the total amount to be allowed for in the budget we feel we should bring to your attention that in our letter of January 20, 1981 we suggested that allowances be made for the following.

v) Modifications to overflows on the 36-inch diameter trunk sanitary sewers on the Lakeshore Road and Rebecca Street sewer system.

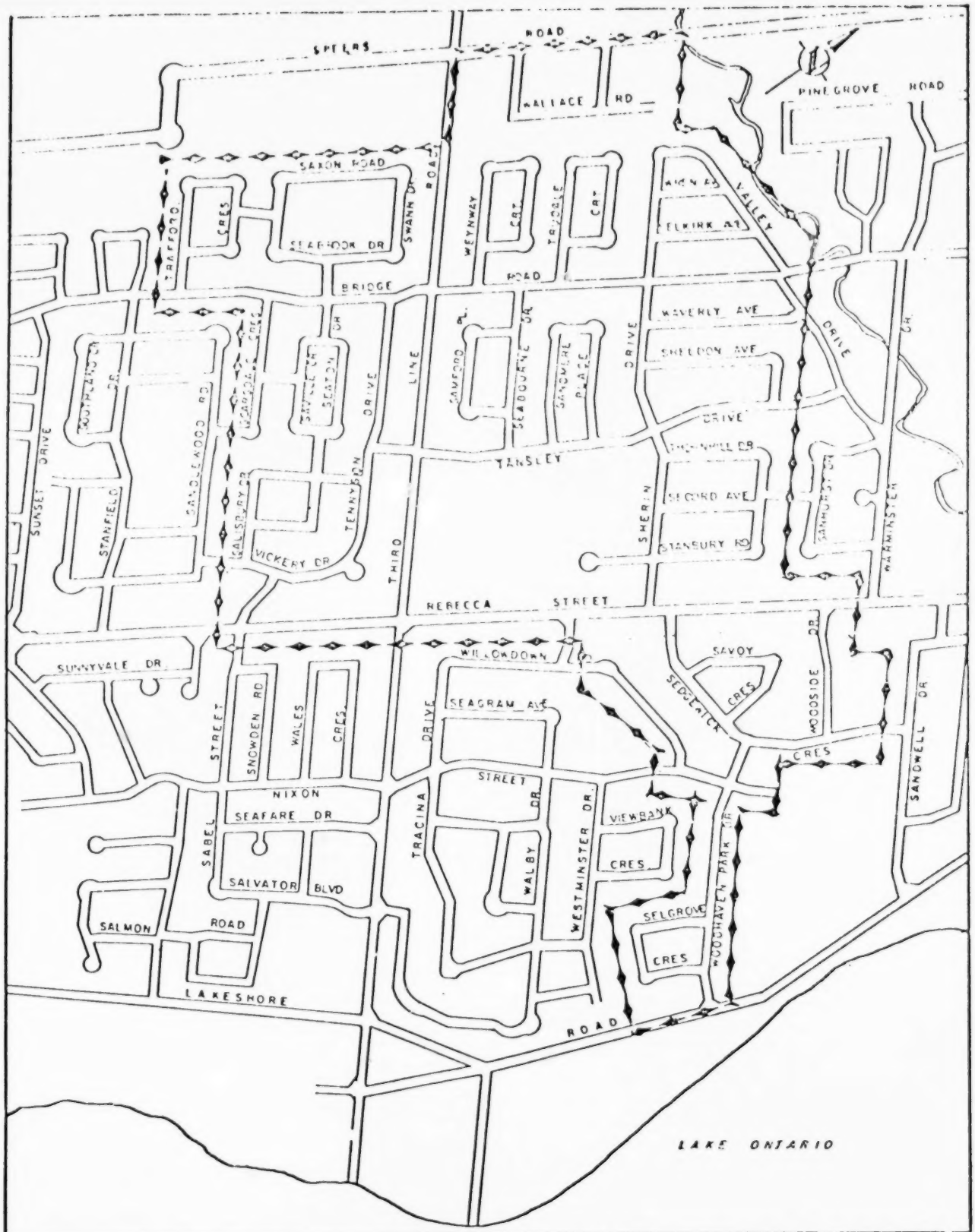
| | |
|---|---|
| Construction | $ 33,000 |
| Engineering | $ 3,300 |
| Total | $ 36,300 |

Summary of Costs

For the purposes of your Budget we have included Item (iv) and therefore recommend that you consider the following allowance for 1982:

| | |
|---|---|
| Construction | $ 270,000 |
| Engineering | $ 38,800 |
| Total | $ 308,800 |

# APPENDIX




# PLAN 'A'

BOUNDARY OF STUDY AREA

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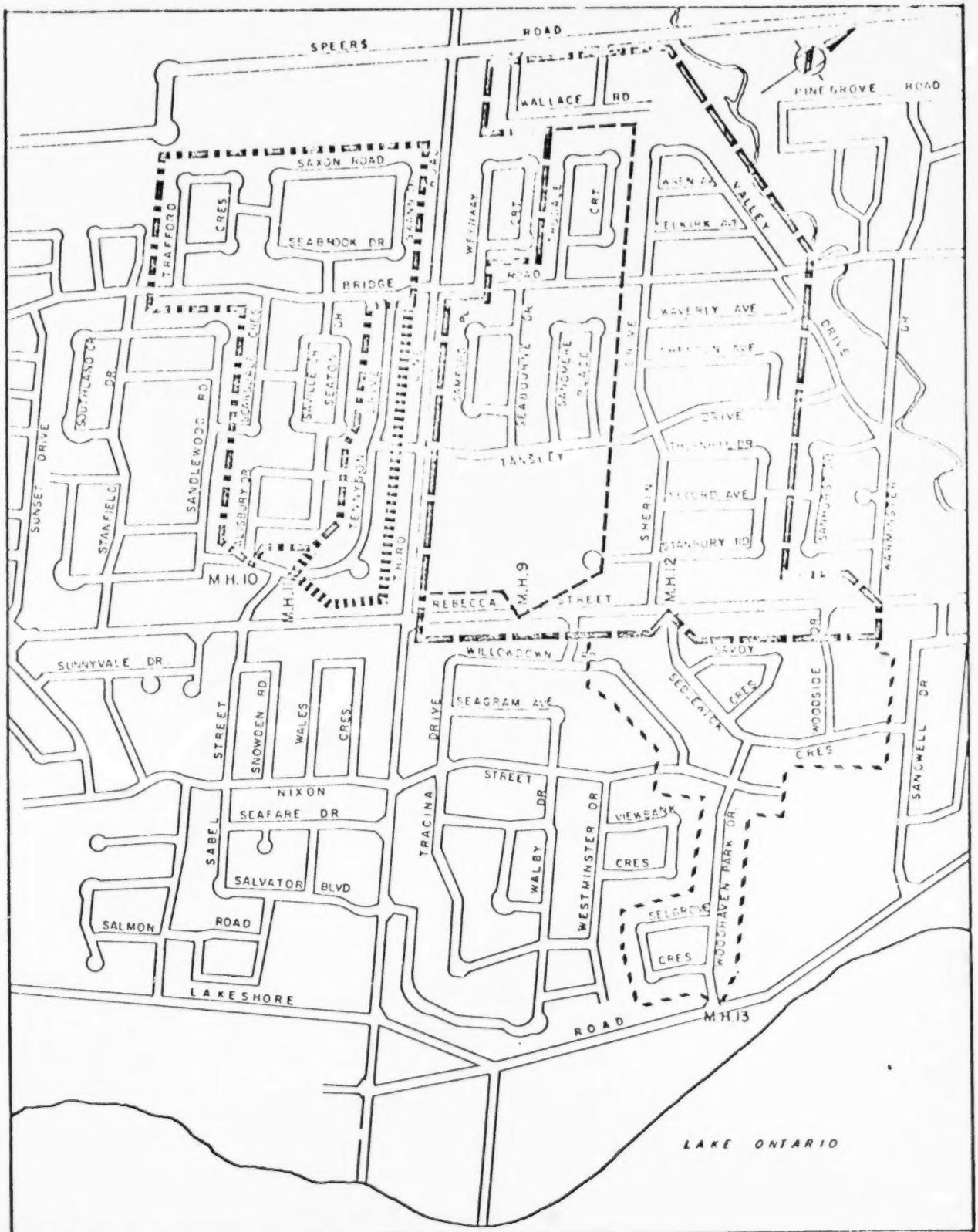
DATE: FEBRUARY 1982




DRAINAGE BOUNDARIES:

AREA I A

AREA I B

AREA II A

AREA II B

# PLAN 'B'

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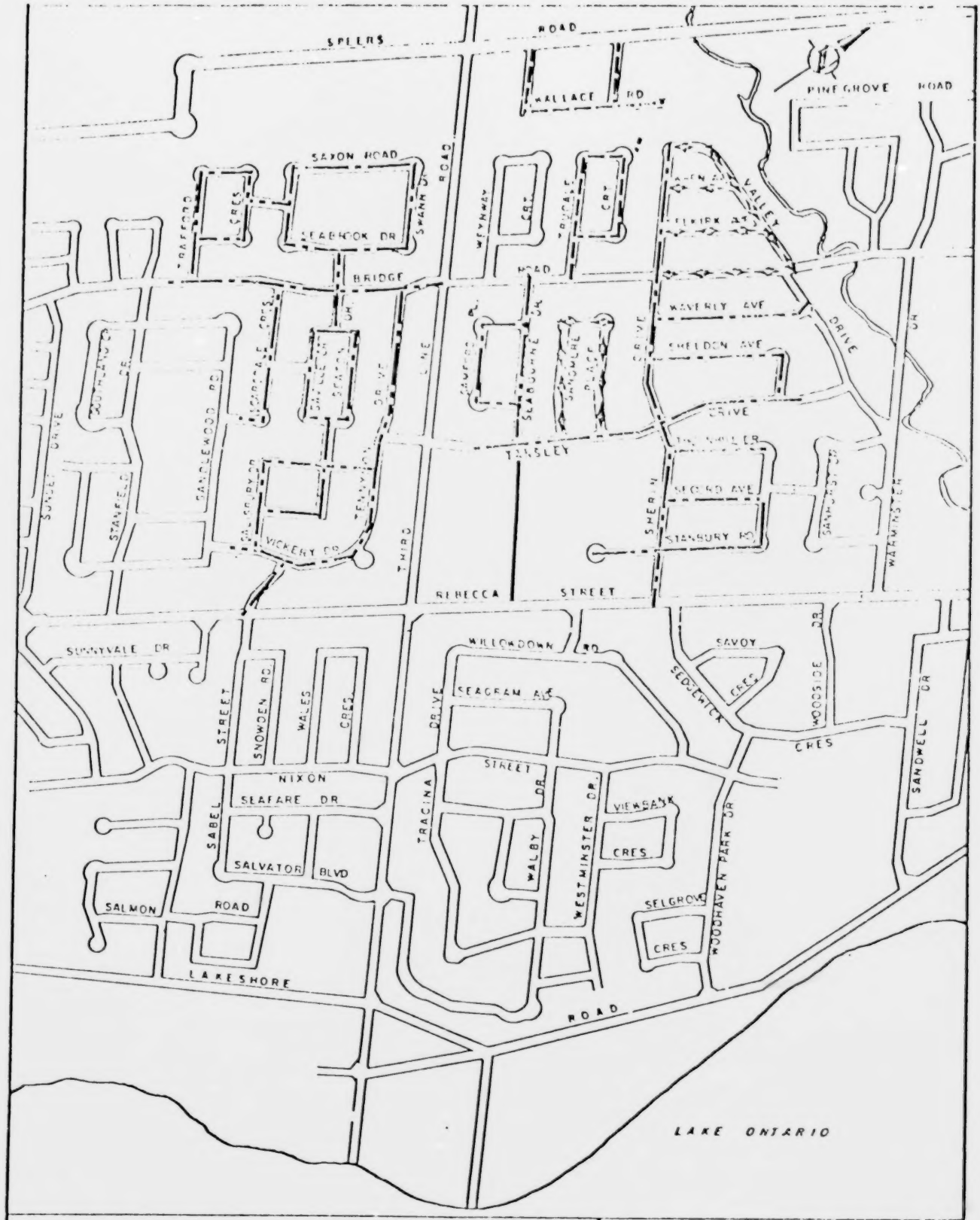
DATE FEBRUARY 1982




PLAN 'C'

LEGEND

- CATEGORY A
- CATEGORY B
- CATEGORY C
- NO TV WORK- AVAILABLE

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TORONTO ONTARIO

DATE- FEBRUARY 1982